AMENDMENTS TO THE CLAIMS

1. (Currently amended) A fluid control valve comprising:

a valve seat [[(110)]];

a flow path through said valve seat;

a diaphragm [[(108)]];

a normally closed pneumatic actuator [[(118)]];

a valve control chamber [[(114)]];

a pneumatic feed line [[(116)]]; and

a pilot valve [[(144)]];

wherein said diaphragm is dispersed between said valve seat and said valve control chamber;

said normally closed pneumatic actuator is configured to normally close said flow path by deflecting said diaphragm to seal over said valve seat;

said pneumatic feed line is in fluidic communication with said normally closed pneumatic actuator; and

said pneumatic feed line is in fluidic communication with said valve control chamber through said pilot valve~~; and~~

~~said pilot valve is in fluidic communication with said valve control chamber~~.

2. (Currently amended) The fluid control valve as in claim 1 wherein:

said pilot valve is a three way normally open valve;

said control chamber communicates with said pneumatic feed line through said pilot valve when said pilot valve is not actuated;

said control chamber is disconnected from said pneumatic feed line by said pilot valve when said pilot valve is actuated; and

said control chamber communicates with a vent line through said pilot valve when said pilot valve is actuated.

Claims 3 – 9 (Canceled)

10. (Currently amended) The fluid control valve as in claim 1 wherein:

said pneumatic actuator includes a stem;

said stem penetrates through the wall of said valve control chamber; and

a sliding seal is dispersed between said stem and said wall of said valve control chamber.

Claims 11 – 78 (Canceled)

79. (Currently amended) A fluid control valve[[,]] comprising:

a valve body ~~wherein~~ having an inlet port and an outlet port ~~ports are formed;~~

a valve ~~camber~~ chamber bottom portion formed in said valve body wherein a first of said ports is connected in serial fluidic communication into said valve bottom portion substantially at the center of said valve chamber bottom portion;

a second of said ports is connected in serial fluidic communication into said valve bottom portion substantially off the center of said valve chamber bottom portion;

a valve seal [[is]] located inside said valve chamber bottom around said first port;

a valve chamber top portion made from a substantially flexible member;

the center of said substantially flexible member is normally positioned substantially separated from said valve chamber bottom portion;

said valve chamber top separates said valve chamber from a valve control chamber;

said valve control chamber comprises a fluid connection port;

said valve control chamber comprises a translatable stem;

~~said translatable stem is~~ actuated by pressurized fluid ~~means~~ through a fluid feed line;

~~said fluid connection port is connected in serial fluidic communication with said fluid feed line;~~

a pilot control valve [[is]] connected in serial fluidic communication between said fluid feed line and said fluid connection port;

the fluid path in said pilot control valve normally connects ~~the fluid from~~ said fluid feed line to said fluid connection port;

said fluid path in said pilot valve disconnects ~~the fluid from~~ said fluid feed line [[to]] from said fluid connection port when actuated and connects said fluid connection port to a vent line when actuated;

said valve stem is normally compressed with a spring to push and deflect said flexible member between said valve chamber and said control chamber to conform and substantially seal over said valve seal; ~~wherein~~ wherein

a fluid is applied through said fluid feed line to actuate said valve stem to translate it away from said flexible member between said valve chamber and said control chamber;

said fluid is applied into said valve control chamber through said fluid path in said pilot valve when said pilot valve is not actuated to deflect said flexible member between said valve chamber and said control chamber to [conform and] substantially seal over said valve seal;

said fluid is vented out of said valve control chamber through said vent line when said pilot valve is actuated to permit [[;]]

said flexible member ~~returns~~ to return to ~~a free-standing~~ an undeflected position thereby opening ~~when said pilot valve is actuated; and~~

said fluid control valve ~~is open~~.

Claims 80 – 138 (Canceled)

139. (Original) A method of operating a fluid control valve comprising:

mechanically holding said valve closed in an inactive state in which it cannot be operated pneumatically;

changing said valve to an active state in which it can be opened and closed pneumatically; and

opening and closing said valve pneumatically.

140. (Original) A method as in claim 139 wherein said changing comprises pneumatically actuating a mechanical valve actuator.

141. (Original) A method as in claim 139 wherein said mechanically holding comprises holding said valve closed with a spring.

142. (Original) A method of operating a fluid control valve comprising:

holding said valve diaphragm closed with a mechanical actuator;

releasing said mechanical actuator; and

opening and closing said valve diaphragm pneumatically.

143. (Original) A method as in claim 142 wherein said releasing is performed pneumatically.

144. (Currently amended) A method as in claim 142 wherein, ~~simultaneous~~ coordinated with said releasing, pneumatic pressure is substituted for mechanical pressure to hold said valve closed.

Claims 145 – 148 (Canceled)

149. (Currently amended) A fluid control valve comprising:

a valve seat;

a flow path through said valve seat;

a flexible member [[62]];

a pneumatic actuator [[64[];

a flexible member chamber [[54[];

a flexible member chamber evacuation port [[56[]; and

an evacuation line [[70[];

wherein said flexible member is dispersed between said valve seat and said flexible member chamber;

said pneumatic actuator is configured to close said flow path by deflecting said flexible member to seal over said valve seat;

said flexible member chamber is pressure sealed; and

said flow path remains pressure sealed from the ambient when a flexible member failure occurs.

150. (Original) The fluid control valve of claim 149, wherein said flexible member comprising a metallic diaphragm.

151. (Original) The fluid control valve of claim 149, wherein said flexible member comprising a metallic bellow.

152. (Original) The fluid control valve of claim 149, wherein said flexible member chamber is further evacuated following a failure of said flexible member.

153. (New) A method of operating a fluid control valve, said method comprising:

providing a valve including a valve control chamber, a valve seat, a fluid flow path through said valve seat, a valve diaphragm, and a valve actuator;

holding said valve diaphragm closed with the force of said valve actuator in an inactive state; and

pneumatically reducing the force of said valve actuator against said valve diaphragm while changing the pressure in said valve chamber to hold said valve diaphragm closed to create an active shut valve state.

154. (New) A method as in claim 153 wherein said valve diaphragm is located between said valve control chamber and said valve seat, and said changing the pressure in said valve chamber comprises increasing the pressure in said valve chamber.

155. (New) A method as in claim 153 wherein said providing further comprises providing a piston connected to said valve actuator, and said pneumatically reducing comprises pneumatically forcing said piston connected away from said valve diaphragm.

156. (New) A method as in claim 155, and further comprising releasing said force on said piston to disable flow through said valve seat when said diaphragm fails.

157. (New) A method as in claim 153, and further comprising:

releasing the pressure in said valve control chamber to open said flow path through said valve seat to create an active open valve state.

158. (New) A method as in claim 157 wherein said providing further comprises providing a pilot valve, and said releasing comprises venting said valve control chamber through said pilot valve.

159. (New) A method as in claim 158 wherein said pilot valve is a three-way normally open valve, said providing further comprises providing a source of pressurized fluid, said changing the pressure in said valve chamber comprises connecting said valve chamber to said pressure source, and said releasing further comprises actuating said pilot valve to disconnect said valve chamber from said pressure source.

160. (New) A method as in claim 159, and further comprising de-actuating said pilot valve to connect said valve chamber to said source of pressurized fluid to disable said fluid flow through said valve seat.

161. (New) A method as in claim 160 wherein the response time for said disabling said fluid flow through said valve seat is one millisecond or less.

162. (New) A method as in claim 160 wherein the response time for said disabling said fluid flow through said valve seat is one-half millisecond or less.

163. (New) A method as in claim 153, and further comprising adjusting the conductance of fluid flow path through said valve seat, wherein said adjusting is performed externally of said fluid valve.

164. (New) A method as in claim 163 wherein said providing further comprises providing a restricted gap between said valve actuator and said valve diaphragm when said valve actuator is released, and said adjusting comprises adjusting the travel of said valve actuator, thereby controlling the size of said restricted gap.

165. (New) A method as in claim 153, and further comprising controlling the pulsed delivery of gas into an atomic layer deposition (ALD) apparatus using said fluid control valve.